DETAILED ACTION

1.   This Office Action is response to Applicants' Amendment filed on 04/17/2009.

Claims 1, 3-5, 10 and 12-14 amended. Claims 2, 6-9, 11 and 15-18 canceled. Claims 1,

3-5, 10 and 12-14 are pending in this Office Action.

EXAMINER'S AMENDMENT

2.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Mr.Joseph Lutz (Reg. No.: 43,765) on 04/16/2009 at (310) 207-3800.

Information Disclosure Statement

3.   The Applicants' Information Disclosure Statements, filed on 04/17/2009 and

04/21/2009, have been received and entered into the record.

4.   **In claims**:

Please replace claims 1, 3-5, 8-10, 12-14 and 17-18 with the amended claims 1,

3-5, 10 and 12-14.

Please cancel claims 7-8 and 17-18.

1.   (Currently Amended) A sentence classification device comprising:

a processor;

a memory for storing a plurality of terms;

a term list having the plurality of terms each term comprising not less than one word;

a Document Term (DT) matrix generation module for generating a DT matrix two-dimensionally expressing a relationship between each document contained in a document set and said each term;

a DT matrix transformation module for generating a transformed DT matrix having respective clusters, each cluster having one or more blocks of associated documents, by transforming the DT matrix obtained by said DT matrix generation module on a basis of a DM decomposition method used in a graph theory to enable document classification without having to preselect cluster categories;

a classification generation module for generating classifications associated with the document set on a basis of a relationship between each cluster on the transformed DT matrix obtained by said DT matrix transformation module and said each document classified according to the clusters, wherein the classification generation module comprises a virtual representative document generation module for generating a virtual representative document, for each cluster on the transformed DT matrix, from a term of each document belonging to the cluster;

a large classification generation module for generating a large classification of documents from each document in a bottom-up manner by repeatedly performing, at each DT matrix transformation, said DM decomposition method used to hierarchically cluster documents by setting said DT matrix generated by said DT matrix generation module in an initial state, causing said virtual representative document generation module to generate a virtual representative document for each cluster on the transformed DT matrix generated from the DT matrix by said DT matrix transformation module, generating a new DT matrix used for next hierarchical clustering processing by adding a virtual representative document to the transformed DT matrix and deleting documents belonging to the cluster of the virtual representative document from the transformed DT matrix, and outputting, for said each cluster, information associated with the documents constituting the respective cluster as large classification data of one or more cluster categories;

a term list edition module for adding or deleting an arbitrary term with respect to the term list;

an index generation module for making said DT matrix generation module generate DT matrices by using term lists before and after edition by said term list edition module, and generating and outputting an index indicating validity of the edition from the DT matrices,

a large classification label generation module for, if a virtual representative document is contained in a given cluster of the respective clusters obtained by the clustering processing, generating a label of the given cluster on which the virtual

representative document is based from a term strongly connected to the virtual

representative document subsequent to classification of the documents into the

respective clusters,

wherein said large classification generation module terminates repetition of the

clustering processing when no cluster is obtained from the transformed DT matrix in the

clustering processing.

3.   (Currently Amended) The sentence classification device according to claim 1,

characterized by further comprising label generation module for outputting each term

strongly connected to each document belonging to said arbitrary cluster as a label

indicating a classification of the cluster.

4.   (Currently Amended) The sentence classification device according to claim 1,

further comprising a document organization module for sequentially outputting

documents belonging to said arbitrary cluster or all documents in an arrangement order

of the documents in the transformed DT matrix.

5.   (Currently Amended) The sentence classification device according to claim 1,

further comprising a summary generation module for outputting, as a summary of said

arbitrary document, a sentence of sentences constituting the document which contains

a term strongly connected to the document.

8-9.   (Cancelled)

10.   (Currently Amended) A sentence classification method comprising:

generating, by using a computer, a Document Term (DT) matrix two-dimensionally expressing a relationship between each document contained in a document set and each term of a term list having a plurality of terms each comprising not less than one word;

generating a transformed DT matrix having respective clusters, each cluster having one or more blocks of associated documents, by transforming the DT matrix on a basis of a DM decomposition method used in a graph theory to enable document classification without having to preselect cluster categories;

generating classifications associated with the document set on a basis of a relationship between each respective cluster on the transformed DT matrix and said each document classified according to the respective clusters, wherein the generating comprises a virtual representative document generation step of generating a virtual representative document, for each respective cluster on the transformed DT matrix, from a term of each document belonging to the respective cluster;

generating a large classification of documents from each document in a bottom-up manner by repeatedly performing, at each DT matrix transformation, said DM decomposition method used to hierarchically cluster documents by setting said DT matrix generated in said DT matrix generation step in an initial state, generating a virtual representative document in a virtual representative document generation step for each

respective cluster on the transformed DT matrix generated from the DT matrix in the DT

matrix transformation step, the step of generating a new DT matrix used for next

hierarchical clustering processing by adding the virtual representative document to the

transformed DT matrix and deleting documents belonging to the cluster of the virtual

representative document from the transformed DT matrix, and the step of outputting, for

said each respective cluster, information associated with the documents constituting the

respective cluster as large classification data of one or more cluster categories; and

adding or deleting an arbitrary term with respect to the term list; and the step of

generating DT matrices by using term lists before and after edition, and generating and

outputting an index indicating validity of the edition from the DT matrices, and

in large classification label generation, if a virtual representative document is

contained in a given cluster of the respective clusters obtained by the clustering

processing, generating a label of the given cluster on which the virtual representative

document is based from a term strongly connected to the virtual representative

document subsequent to classification of the documents into the respective clusters,

wherein in the large classification generation step, repetition of the clustering

processing is terminated when no cluster is obtained from the transformed DT matrix in

the clustering processing.

12.   (Currently Amended) The sentence classification method according to claim 10,

characterized by further comprising the step of outputting each term strongly connected

to each document belonging to said arbitrary cluster as a label indicating a classification of the cluster.

13.   (Currently Amended) The sentence classification method according to claim 10, further comprising the step of sequentially outputting documents belonging to said arbitrary cluster or all documents in an arrangement order of the documents in the transformed DT matrix.

14.   (Currently Amended) The sentence classification method according to claim 10, further comprising the step of outputting, as a summary of a document, a sentence of sentences constituting said arbitrary document which contains a term strongly connected to the document.

17-18.   (Cancelled)

Allowable Subject Matter

5.   Claims 1, 3-5, 10 and 12-14 are allowed.

The closest prior art, Patent No.: US 7,024,400 B2 of Tokuda et al. (hereinafter Tokuda) teaches a method for automatic document classification based on a combined use of the projection and the distance of the differential document vectors to the differential latent semantics index spaces; where Patent No.: US 6,067,259 A of Handa et al. (hereinafter Handa) teaches a method and device for repairing arrays with redundancy, in which the repair solution for repairing the faults of memory cells by the use of spare cells lines; where Patent Application No.: US 2001/0037324 A1 of Agrawal et al. (hereinafter Agrawal) teaches a system and article of manufacture for organizing and indexing information items such as documents by topic, and in preferred embodiments, to such a process, system and article which employ a topic hierarchy and involve a determination of discriminating terms and stop terms at each internal node in the topic hierarchy; where Patent Application No.: US 2004/0205457 A1 of Bent et al. (hereinafter Bent) teaches a method of detecting and summarising at least one topic in at least one document of a document set, each document in said document set having a plurality of terms and a plurality of sentences comprising said plurality of terms.

In combination, Tokuda, Handa, Agrawal and Bent fail to teach a DT matrix generation module for generating a DT matrix two-dimensionally expressing a relationship between each document contained in a document set and said each term;

a DT matrix transformation module for generating a transformed DT matrix having respective clusters, each cluster having one or more blocks of associated documents, by transforming the DT matrix obtained by said DT matrix generation module on the basis of a DM decomposition method used in a graph theory to enable document classification without having to preselect cluster categories; a classification generation module for generating classifications associated with the document set.

However, the prior arts of record such as Tokuda, Handa, Agrawal and Bent do not teach or fairly suggest a large classification generation module for generating a large classification of documents from each document in a bottom-up manner by repeatedly performing, at each DT matrix transformation, said DM decomposition method used to hierarchically cluster documents by setting said DT matrix generated by said DT matrix generation module in an initial state, causing said virtual representative document generation module to generate a virtual representative document for each cluster on the transformed DT matrix generated from the DT matrix by said DT matrix transformation module, generating a new DT matrix used for next hierarchical clustering processing by adding a virtual representative document to the transformed DT matrix and deleting documents belonging to the cluster of the virtual representative document from the transformed DT matrix, and outputting, for said each cluster, information associated with the documents constituting the respective cluster as large classification data of one or more cluster categories;

a term list edition module for adding or deleting an arbitrary term with respect to the term list;

an index generation module for making said DT matrix generation module generate DT matrices by using term lists before and after edition by said term list edition module, and generating and outputting an index indicating validity of the edition from the DT matrices;

a large classification label generation module for, if a virtual representative document is contained in a given cluster of the respective clusters obtained by the clustering processing, generating a label of the given cluster on which the virtual representative document is based from a term strongly connected to the virtual representative document subsequent to classification of the documents into the respective clusters,

wherein said large classification generation module terminates repetition of the clustering processing when no cluster is obtained from the transformed DT matrix in the clustering processing (in claim 1).

However, the prior arts of record such as Tokuda, Handa, Agrawal and Bent do not teach or fairly suggest generating a large classification of documents from each document in a bottom-up manner by repeatedly performing, at each DT matrix transformation, said DM decomposition method used to hierarchically cluster documents by setting said DT matrix generated in said DT matrix generation step in an initial state, generating a virtual representative document in a virtual representative

document generation step for each respective cluster on the transformed DT matrix

generated from the DT matrix in the DT matrix transformation step, the step of

generating a new DT matrix used for next hierarchical clustering processing by adding

the virtual representative document to the transformed DT matrix and deleting

documents belonging to the cluster of the virtual representative document from the

transformed DT matrix, and the step of outputting, for said each respective cluster,

information associated with the documents constituting the respective cluster as large

classification data of one or more cluster categories; and

adding or deleting an arbitrary term with respect to the term list; and the step of

generating DT matrices by using term lists before and after edition, and generating and

outputting an index indicating validity of the edition from the DT matrices, and

in large classification label generation, if a virtual representative document is

contained in a given cluster of the respective clusters obtained by the clustering

processing, generating a label of the given cluster on which the virtual representative

document is based from a term strongly connected to the virtual representative

document subsequent to classification of the documents into the respective clusters,

wherein in the large classification generation step, repetition of the clustering

processing is terminated when no cluster is obtained from the transformed DT matrix in

the clustering processing (in claim 10).

The dependent claims bring definite, further limiting, and fully enable by the

specification are also allowed.

6.   Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Contact Information

7.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James Hwa whose telephone number is 571-270-1285.

The examiner can normally be reached on 8:00 – 5:00.If attempts to reach the examiner

by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached

on 571-272-1834. The fax phone number for the organization where this application or

proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only, for more

information about the PAIR system, see http://pair-direct.uspto.gov. Should you have

questions on access to the PAIR system contact the Electronic Business Center (EBC)

at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer

Service Representative or access to the automated information system, call 800-786-

9199 (IN USA OR CANADA) or 571-272-1000.

05/02/2009

/James Hwa/
Examiner, Art Unit 2163

/Cam Y Truong/
Primary Examiner, Art Unit 2169